National Institute of Environmental Health Sciences

Ciguatera fish poisoning and climate change: Analysis of national poison center data in the United States, 2001-2011

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Abstract:

Background: Warm sea surface temperatures (SSTs) are positively related to incidence of ciguatera fish poisoning (CFP). Increased severe storm frequency may create more habitat for ciguatoxic organisms. Although climate change could expand the endemic range of CFP, the relationship between CFP incidence and specific environmental conditions is unknown. Objectives: We estimated associations between monthly CFP incidence in the contiguous United States and SST and storm frequency in the Caribbean basin. Methods: We obtained information on 1,102 CFP-related calls to U.S. poison control centers during 2001-2011 from the National Poison Data System. We performed a time-series analysis using Poisson regression to relate monthly CFP call incidence to SST and tropical storms. We investigated associations across a range of plausible lag structures. Results: Results showed associations between monthly CFP calls and both warmer SSTs and increased tropical storm frequency. The SST variable with the strongest association linked current monthly CFP calls to the peak August SST of the previous year. The lag period with the strongest association for storms was 18 months. If climate change increases SST in the Caribbean 2.5-3.5°C over the coming century as projected, this model implies that CFP incidence in the United States is likely to increase 200-400%. Conclusions: Using CFP calls as a marker of CFP incidence, these results clarify associations between climate variability and CFP incidence and suggest that, all other things equal, climate change could increase the burden of CFP. These findings have implications for disease prediction, surveillance, and public health preparedness for climate change.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4050511

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Food/Water Quality, Food/Water Quality, Food/Water Security

Extreme Weather Event: Hurricanes/Cyclones

Food/Water Quality: Biotoxin/Algal Bloom, Biotoxin/Algal Bloom, Other Water Quality Issue

Water Quality (other): Sea surface temperature

Food/Water Security: Fisheries

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Morbidity/Mortality, Other Health Impact

Other Health Impact: Ciguatera fish poisoning (CFP)

Medical Community Engagement:

resource focus on how the medical community discusses or acts to address health impacts of climate change

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Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Children, Elderly

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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